The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A system for performing fragmentation analysis, the system comprising:

a camera configured for capturing a plurality of images of fragmented particles, wherein the plurality of images include at least two images for each group of fragmented particles; and

at least one processor for executing programmable instructions for generating at least one of a fragmentation distribution of the fragmented particles corresponding to at least one of the plurality of images, and a total fragmentation distribution of the fragmented particles corresponding to two or more of the plurality of images.

2. The system according to Claim 1, further comprising:

means for determining an orientation and a direction of travel for each vehicle of a plurality of vehicles loaded with a respective group of fragmented particles; and

means for identifying each of the plurality of vehicles.

3. The system according to Claim 2, wherein the means for determining an orientation and a direction of travel includes at least one tag having a plurality of markers and mounted to each of the plurality of vehicles, and the means for identifying includes a subset of the plurality of markers providing a respective identification code for each of the plurality of vehicles.

4. The system according to Claim 1, further comprising:

means for scaling each of the plurality of images to locate side edges of a scale positioned in an image view of the camera; and

means for measuring a pixel distance between the side edges to obtain a length to pixel ratio (LPR).

5. The system according to Claim 4, wherein the means for scaling includes means for using a Hough transformation method to determine a straight line passing through a maximum number of non-zero pixels in a binary image corresponding to at least one of the plurality of images.

6. The system according to Claim 1, wherein each of the plurality of images is a top view image of the fragmented particles.

7. The system according to Claim 1, further comprising:

means for detecting entry of an object within a field of view of the camera; and

means for detecting exit of the object from within the camera's field of view.

8. The system according to Claim 7, wherein the means for detecting entry of an object comprises:

means for taking two bands of pixels from the top and bottom of the camera's field of view;

means for calculating the standard deviation of the intensity of red channel pixels within the two bands;

means for comparing the calculated standard deviation to a standard deviation of a blank image; and

means for determining that the object has entered the camera's field of view if the calculated standard deviation is greater than the standard deviation of the blank image.

9. The system according to Claim 7, further comprising means for determining whether the object detected as having entered the camera's field of view by the means for detecting entry is a vehicle.

10. The system according to Claim 9, wherein the means for determining whether the object detected as having entered the camera's field of view is a vehicle comprises means for determining if an image representing the object within the

camera's field of view contains an identification object by analyzing a binary image corresponding to the image.

11. The system according to Claim 1, further comprising:

means for determining a region of interest (ROI) window within each of the plurality of images;

means for performing a segmentation process for the ROI window for generating a final blob image for each of the plurality of images; and

means for determining the major and minor diameters of blobs in the blob image.

12. The system according to Claim 11, wherein the means for performing a segmentation process comprises:

means for separating blobs in a segmented gray scale image to produce a blob image;

means for determining edges of the fragmented particles to produce a edge image; and

means for combining the blob and edge images to produce the final blob image.

13. The system according to Claim 11, wherein the at least one processor produces fragmentation results by using the major and minor diameters of blobs in the blob image corresponding to each of the plurality of images.

14. The system according to Claim 1, wherein the fragmentation distributions are volume distributions of the fragmented particles.

15. A method for performing fragmentation analysis, the method comprising the steps of:

capturing a plurality of images of fragmented particles, wherein the plurality of images include at least two images for each group of fragmented particles; and

executing programmable instructions for generating at least one of a fragmentation distribution of the fragmented particles corresponding to at least one of the

plurality of images, and a total fragmentation distribution of the fragmented particles corresponding to two or more of the plurality of images.

16. The method according to Claim 15, further comprising the steps of:

determining an orientation and a direction of travel for each vehicle of a plurality of vehicles loaded with a respective group of fragmented particles; and

identifying each of the plurality of vehicles.

17. The method according to Claim 16, wherein the step of determining an orientation and a direction of travel includes the step of providing at least one tag having a plurality of markers to each of the plurality of vehicles, and the step of identifying each of the plurality of vehicles includes determining a respective identification code for each of the plurality of vehicles using a subset of the plurality of markers.

18. The method according to Claim 15, further comprising the steps of:

scaling each of the plurality of images to locate side edges of a scale positioned in an image view of the camera; and

measuring a pixel distance between the side edges to obtain a length to pixel ratio (LPR).

19. The method according to Claim 18, wherein the step of scaling includes the step of using a Hough transformation method to determine a straight line passing through a maximum number of non-zero pixels in a binary image corresponding to at least one of the plurality of images.

20. The method according to Claim 15, wherein the step of capturing the plurality of images includes the step of providing a camera to capture top view images of the fragmented particles.

21. The method according to Claim 15, further comprising the steps of:

detecting entry of an object within a field of view of a camera positioned for capturing the plurality of images; and

detecting exit of the object from within the camera's field of view.

22. The method according to Claim 21, wherein the step of detecting entry of an object comprises the steps of:

taking two bands of pixels from the top and bottom of the camera's field of view;

calculating the standard deviation of the intensity of red channel pixels within the two bands;

comparing the calculated standard deviation to a standard deviation of a blank image; and

determining that the object has entered the camera's field of view if the calculated standard deviation is greater than the standard deviation of the blank image.

23. The method according to Claim 21, further comprising the step of determining whether the object detected as having entered the camera's field of view is a vehicle.

24. The method according to Claim 23, wherein the step of determining whether the object detected as having entered the camera's field of view is a vehicle comprises the step of determining if an image representing the object within the camera's field of view contains an identification object by analyzing a binary image corresponding to the image.

25. The method according to Claim 15, further comprising the steps of:

determining a region of interest (ROI) window within each of the plurality of images;

performing a segmentation process for the ROI window for generating a final blob image for each of the plurality of images; and

determining the major and minor diameters of blobs in the blob image.

26. The method according to Claim 25, wherein the means for performing a segmentation process comprises the steps of:

separating blobs in a segmented gray scale image to produce a blob image;

determining edges of the fragmented particles to produce a edge image; and

combining the blob and edge images to produce the final blob image.

27. The method according to Claim 25, further comprising the step of producing fragmentation results by using the major and minor diameters of blobs in the blob image corresponding to each of the plurality of images.

28. The method according to Claim 15, wherein the fragmentation distributions are volume distributions of the fragmented particles.